The Significance of the Millennium

The millennium has no natural terrestrial, sidereal, or cosmic basis or importance. But the last years of the twentieth century are the first in human history in which there has been a worldwide recognition that a millennium measured by a universally accepted calendar is about to end and a new one begin.

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Early in 1996 the Rainbow Room in New York and the Savoy in London announced their facilities were fully booked and they could accept only waiting list reservations for the night of December 31, 1999. Other popular places for New Year's Eve celebrations have similarly been receiving requests for reservations more than three years in advance of the beginning of the year 2000. A cruise-line fleet of sailing ships has been fully chartered as of September 1996, and another cruise line is taking reservations (with deposits) for "Turn of the Century" cruises.

Such lengthy anticipation is most extraordinary. There are several reasons for such interest; but it is at least partially attributable to our addiction to the decimal (or base ten) sys-

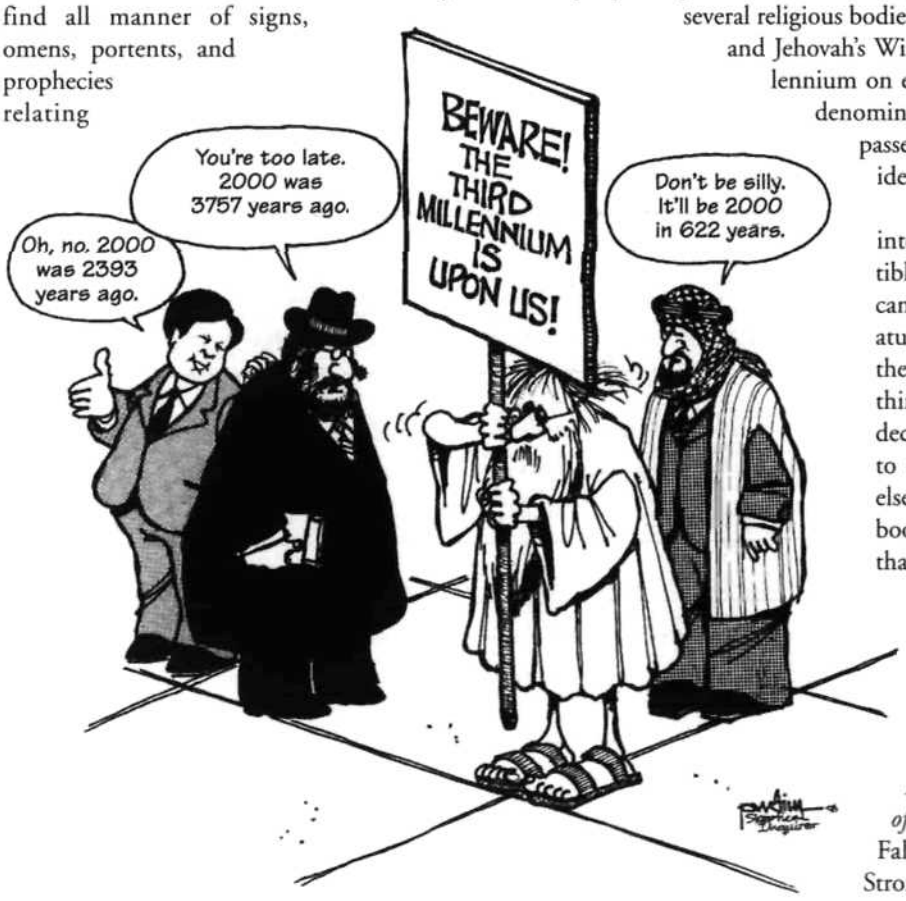
tem of numeration which leads us to be unusually attentive to occasions that mark a new decimal date, such as the end of a decade. But decades succeed each other with regularity, and seem to pass more quickly and become more commonplace as we grow older. The centuries are more notable. There are probably few people planning to celebrate the advent of the twenty-first century who have previously celebrated the passage from the nineteenth to the twentieth century. As for the millennia, there is not even a good historical account of the transition from the year 999 to the year 1000. So the simultaneous passage of a decade, a century, and a millennium will be not merely unusual, but actually unique, for as the story of the calendar related here discloses, this is the first time in human history that there has been a generally recognized transition from one calendar millennium to another.

This poses the question whether the coming of a new millennium is anything more than a social excuse for revelry as we turn three decimal calendar pages at once. At the same time, voices are heard reminding us that in addition to conventional social celebrants there are those who attach special and cosmic significance to particular calendar dates. The *New York Times* (July 20, 1996) reports: "As the year 2000 approaches, declarations that a vast metaphysical change will coincide with the turn of the chronological odometer have not lacked an audience. Twice in the past decade, for example, books that set dates for Christ's Second Coming sold well enough to generate numerous news stories."

As we draw closer to 2000 an increasing number of people find all manner of signs, omens, portents, and prophecies relating to the millennium. The imminence of a new millennium has stimulated Professor Harold Bloom of Yale to explicitly embrace Gnosticism, a pre-Christian antithesis of agnosticism. In *Omens of Millennium: The Gnosis of Angels, Dreams, and Resurrection* (Riverhead Books, 1996), Professor Bloom declares that the core of his and our national religion is an intuitive belief in a transcendental God who is not the Creator, which is a kind of millenarian spiritualism evidenced by a variety of omens everywhere.

In the jargon of many less philosophical believers, the new millennium is simply a "New Age." Others recall that in the New Testament Book of Revelation a period of one thousand years is foretold in which the devil will be chained and holiness will prevail on earth. This has given rise to several religious sects and differing interpretations. Premillenarians are Christians who believe that the Second Coming of Christ will begin the 1000-year period of righteousness, while Postmillenarians are Christians who believe that eventually Christianity will be accepted throughout the world and a 1000-year period of righteousness will be climaxed by the return of Christ.

A number of related Protestant denominations known as "Adventists" stress the doctrine of the imminent Second Coming of Christ. One of the earliest advocates of this view was the American Baptist preacher William Miller, who proclaimed that the Second Coming would occur between March 21, 1843, and March 21, 1844. When this and a subsequent prediction failed, many lost faith and the remainder split into several religious bodies, including the Seventh-Day Adventists and Jehovah's Witnesses. The concept of a religious millennium on earth is now rejected by most Christian denominations, but the term "millennium" has passed into popular usage as denoting an ideal or utopian period.



Millennial fever has also seeped into intellectual fields not normally susceptible to popular fads. Harvard doctoral candidate Mihir Desai surveys recent literature and concludes that "[a]s we approach the end of a millennium, authors and thinkers in a variety of fields seem eager to declare the end of something—and unable to announce the beginning of something else." Thus the shelves of contemporary bookstores are lined with books declaring that the end of everything has come. These include: *The End of Nature* (Bill McKibben); *The End of History and the Last Man* (Francis Fukuyama); *The End of Architecture* (Vienna Architecture Conference, 1992); *The End of Physics* (David Lindley); *The End of Science* (John Horgan); *The End of Sovereignty* (Joseph Camilleri and Jim Falk); *The End of Isms* (Alexander Stromas); and *The End of Japan Incorporated*

The Pedantic Argument about the Beginning of the Millennium

This history is an effective response to the somewhat pedantic argument that the year 2001, rather than the year 2000, is the beginning of the twenty-first century and of the next millennium.

That argument is based on the assertion that there never was a year zero and that the first year of the calendar was numbered 1, so each century must end in a year designated by a decimal number ending with a zero. But this argument wholly ignores the fact that historically the Gregorian calendar did not begin with a year numbered 1, nor with any year numbered in single or double digits. The numbers assigned to years in the Gregorian calendar are based on a calculation of the year of Christ's birth, which, as noted, was probably erroneous and was three years late. By the time the present numeration of years was generally accepted, it was late in the first millennium.

If the western Europeans then using the Julian predecessor to the Gregorian calendar thought about the matter at all, they probably regarded the year 1000 as the beginning of a new century and millennium. The transition from a three-digit to a four-digit designation of a year surely would have suggested such a view. In any event, whether it was so regarded contemporaneously or not, it is reasonable to regard the year 1000 as beginning the tenth century and the second Christian millennium; the year 1900 as beginning the twentieth century; and the year 2000 as beginning the twenty-first century and the new millennium.

This view provides the "zero years" sought by those inclined to argue the matter. Indeed, considering the basis and historical development of the system of numbering years in the Gregorian calendar, if there is any error in celebrating the beginning of a new century and millennium in the year 2000, it is probably in celebrating too late rather than too early.

(Christopher Wood). Like titles exist proclaiming the end of: the nation state (Kenichi Ohmae and Jean Marie Guehenno); economics (Paul Ormerod); laissez faire (Robert Kuttner); affluence (Jeffrey Madrick); work (Jeremy Rifkin); equality (Mickey Kaus); racism (Dinesh D'Souza); affirmative action (Darien McWhirter); education (Neil Postman); bureaucracy (Gifford and Elizabeth Pinchot); intimacy (Philip Brown); marriage (Julian Hafner); and, of course, meaning (George Zito). (Source: *New York Times,* August 24, 1996.)

To appraise properly the significance of the next millennium, or any calendar date, it is necessary to know something about the nature and history of the calendar. From earliest antiquity, humans have regulated their lives by the alternation of days and nights and succession of seasons, and have established religious observations by phases of the moon. Thus human activity has been governed by (what we now know to be) the rotation of the earth on its axis, the orbiting of the moon around the earth, and the earth's orbit of the sun. Formal calendars, or schedules of these events, were not constructed until some time after the invention of writing in Sumeria (part of Babylonia) about 3100 B.C. (by modern reckoning), or some five millennia ago.

The basic problem for all calendar makers has been to find some simple relationship between the solar (i.e., terrestrial) day, the lunar month, and the tropical (i.e., seasonal) or solar year. Modern scientific astronomy and instrumentation have established the lunar month as consisting of 29.53059 days, the tropical or solar year as 365.242199 mean solar days, and each mean solar day as 24 hours, 3 minutes, and 56.55 seconds, calculated as the average time it takes the sun's ecliptic (or apparent path) to cross the meridian (or celestial equator) twice. To complicate matters further, recent studies indicate that the gravitational attraction of the moon and the sun on the earth cause the earth's rate of rotation to slow very gradually so that 900 million years ago the day was only about 18 hours long and there were more than 450 days in the solar year (*Science,* July 5, 1996, 100).

Unfortunately, the tropical or solar year and the lunar month are and have been incommensurable, and neither is evenly divisible by the length of the day. As a result, throughout most of human history there have been divergent and inconsistent calendars.

The earliest known calendar was a lunar calendar of Egypt based on sidereal observations. Because this was incompatible with either a lunar or solar year, Egyptians established a civil calendar that had 12 months of 30 days each, followed by 5 intercalary (or interpolated) days not assigned to any month. The year was divided into 3 seasons of 4 months each, called Flood Time, Seed Time, and Harvest Time. As this year had just 365 days, it was shorter than the solar year and thus shifted gradually with respect to the natural seasons. To provide for practical affairs and religious observations, the Egyptians established a second lunar calendar for use when the beginning of their lunar year came before the beginning of their civil year. Later a 25-year cycle of intercalation was introduced while the original lunar calendar was retained for agricultural purposes. So the ancient Egyptians had three different calendars used for three different purposes.

The Babylonian calendar was based on lunar phases, and a year contained 12 lunar months each beginning the day after a new moon was observed by the priests. An intercalary month was inserted at irregular intervals to help synchronize the calendar with actual seasons. Prior to 480 B.C. intercalations appear to have been wholly haphazard, and it is difficult or impossible to convert Babylonian dates to present calendar ones.

The Greek calendar was similar to the Babylonian; but before the sixth century B.C., Greek calendar reckoning was

entirely controlled by local authorities who decreed the beginning of each month and dates of intercalation. This led to wide variation among communities, and more than a hundred different calendars are known to have existed simultaneously in Greece. Later, after the sixth century B.C., a thirteenth month was inserted according to fixed rules, and this system was used until the Roman period.

The early Roman calendar, established by Romulus according to legend, originated as a local calendar for the city of Rome about the seventh or eighth century B.C. By this calendar, the year began in March and consisted of 10 months—6 of 30 days and 4 of 31 days—for a total of 304 days. The year ended in December and was followed by an uncounted winter gap. The second king of Rome added 2 extra months, January and February, to fill the gap and increase the number of days to 354. Intercalary months were added whenever the high priests thought necessary. But the priests were often remiss until the calendar months had receded about 60 days from their customary positions in the tropical or solar year. To make up for past deficiencies, Julius Caesar, on the advice of Alexandrian astronomer Sosigenes, extended the length of the year now calculated to have been 46 B.C. to 445 days and ordered that future years have 365 days with an intercalary day at the end of February every fourth year. This calendar is known as the Julian calendar. The plan was misinterpreted by Roman priests who used an intercalary day every 3 years until the mistake was discovered during the reign of Augustus about 8 B.C. All leap years were then omitted until the year 7 A.D., after which the normal sequence of the Julian calendar was resumed.

The Mayan calendar, in use in Middle America, had a year of 18 months of 20 days each. The years began at different times and in different seasons in different regions. Each year was known by the name of the day on which it began. Modern studies indicate the Mayan calendar had little to do with astronomy, and its calculations are not well understood.

The Mexican or Aztec calendar was similar to the Mayan, although not synchronous with it. The Aztec calendar had a year of 365 days with 18 months of 20 days and an additional 5 days. The Aztecs used a more primitive numbering system than the Mayans and lacked a precise way of recording dates.

Peru used an Inca calendar of which little is known. The Incas had no written language, but historians agree that they had a calendar based on observations of both the sun and moon and their relationship to the stars.

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No North American Indian tribes had a true calendar. The day was the basic unit of time, but there is no record of any aboriginal names for days, and apparently time was designated only by seasons and moons.

The Chinese had established a calendar by the fourteenth century B.C. based on a solar year of 365.25 days and a lunar month of 29.5 days. This early Chinese calendar was based on astronomy that was superior to that of other nations at least until about the thirteenth century A.D.

The early history of the Hebrew calendar is obscure, although we know it was based on lunar months. The modern Jewish calendar was introduced in the fourth century A.D. by Rabbi Hillel II and is dated from the legendary day of creation of the earth, calculated as being October 6, 3761 B.C. (according to modern notation), with years designated as A.M. for Anno Mundi, or "year of the world."

The Muslims use an Islamic calendar, the starting point of which is computed from the Hegira, the year of emigration in which Muhammad emigrated from Mecca to Medina, beginning July 15, 622 A.D. The years are lunar, consisting of 354 days, so months regress through all seasons every 32.5 years. A cycle of 10,631 days is used to govern intercalation for the sole purpose of keeping months in step with lunar phases. Thus this calendar pays no attention to seasons and 33 Muslim years are roughly equivalent to 32 solar years.

For all ancient calendars, the only unit of time longer than a year was the reign of a king or priest, so the earliest method of distinguishing years was by the naming of them after some royal exploit, such as a conquest or temple construction. In Assyrian and Hittite calendars, years bore the names of officials elected for those years. Later these practices were supplanted by dating years according to the regnal reign, with the count starting at 1 with each new king. While there was some variation in style for different calendars, an example of a full civil date according to an Egyptian calendar would be "Regnal Year 1, fourth month of Inundation, day 5, under the Majesty of King So-and-so."

In the sixth century A.D., a monk named Dionysius Exiguus, in calculating the date of Easter for the Pope, calculated that the year now designated as 1 B.C. was the year of Christ's birth. Because of this, he suggested that years thereafter be numbered consecutively to signify the Christian era and be designated A.D., for Anno Domini, or "year of the Lord." Modern chronology indicates that the birth actually occurred in 4 B.C., but the suggestion of serial numbering was welcomed by Christian scholars and was gradually adopted by Christian countries during the next 500 years.

Although there was some convergence among Christian countries during the period from the sixth to sixteenth centuries A.D. concerning numerical designation of years, there continued to be divergence as to when a year began. The beginning date of each year was governed by local tradition in most places. The most common initial dates were December 25, January 1, March 1, and March 25. In Great Britain, under the Julian calendar, the year had first begun on December 25, and from the fourteenth century A.D. on it had

begun on March 25, which continued until the adoption of the Gregorian calendar in 1752. In Athens the year began roughly in midsummer when new officials took office. Other Greek cities adhered to initial dates of the years of their arbitrary local calendars even after adoption of the Julian calendar throughout the Roman Empire. In countries of Middle America using the Mayan calendar, the years began at different times and in different seasons in each country.

Calendars used for setting religious holidays also differ as to beginning of the year. The Jewish calendar begins the year on varying dates in September (according to the Gregorian calendar); and the Islamic calendar begins the year in July. Greek and Russian orthodox Christian communities still reckon their religious holidays by the Julian calendar.

The year of the Julian calendar, which had been established in 46 B.C., was 365.25 days—11 minutes and 14 seconds too long. This error amounted to 1.5 days in 200 years and to 7 days in 1000 years. By 1545 A.D. the vernal equinox had moved 10 days from its proper position, falling on March 11 instead of March 21. This caused Easter to be celebrated too late in that year. The Council of Trent authorized Pope Paul III to correct the calendar, but Paul was unable to take satisfactory action and left the problem to his successors. In 1572 Gregory XIII became Pope and found proposals for reforming the calendar awaiting him. Pope Gregory XIII referred these proposals to Jesuit astronomer Christopher Clavius, who drafted a papal bull that was issued in 1582 establishing what is now known as the Gregorian calendar.

The papal bull of Gregory XIII decreed that the day after Thursday, October 4, 1582 A.D., should be called Friday, October 15, and the length of the year was redefined to be 365.2422 days. This also provided that no centennial year could be a leap year unless it was divisible by 400, so that 1700, 1800, and 1900 were common years, while 2000 will be a leap year. This produces a very accurate calendar in which the difference between the calendar year and the solar year is less than half a minute. The Gregorian calendar also firmly established January 1 as the beginning of the year.

The Gregorian calendar was immediately adopted for use in all Catholic countries, but Protestant countries opposed it at first. The British Empire and the American colonies did not adopt the Gregorian calendar until 1752. In order to bring their old calendar into synchronization with the Gregorian, the British declared the day following September 2, 1752, to be September 14. In many countries, including Great Britain and the American colonies, the calendar was termed "New Style" when it was conformed to the Gregorian.

In France, Italy, Luxembourg, Portugal, and Spain, the New Style was adopted in 1582; and it was adopted in 1584 by most of the German Roman Catholic states, Belgium, and part of the Netherlands. Switzerland gradually adopted it, beginning in 1583 and completing in 1812. Hungary adopted it in 1587. Then more than a century passed before the Protestant countries accepted the New Style. Denmark and the Dutch and German Protestant states adopted the New Style in 1699 and 1700, respectively, Sweden in 1753, Japan in 1873, and Egypt in 1875. Between 1912 and 1917 it was adopted in Albania, Bulgaria, China, Estonia, Latvia, Lithuania, Romania, Turkey, and Yugoslavia. The Soviet Union became Gregorian in 1918, and Greece in 1923. Today, the Gregorian calendar is in official use for civilian purposes throughout most of the world, although in India, Hindu religious life is governed by the Hindu calendar, which is based on lunar revolutions adapted to solar reckoning; and in Iran, the official calendar is Gregorian, but the Islamic calendar is also used.

As this very cursory survey indicates, the story of the calendar relating, as it does, to the earliest period of recorded human history, is not only complex but also confusing, as various sources give somewhat inconsistent accounts of some details. Nevertheless, the basic facts are clear and corroborated by all sources. The most fundamental aspect of all calendars, as illustrated by the foregoing survey, is that they consist of schedules for dividing time into days, months, and years, and assigning designations to such divisions

of time so that individuals can communicate specifications of time without ambiguity. Inherent in this process is the fact that nature has not provided convenient or commensurable units of time, so all such schedules are necessarily arbitrary and only approximate the astronomical events to which the days, months, and years correspond. This has caused all calendars to be revised from time to time, with official acceptance based upon utility and convenience rather than correspondence to any cosmic imperative.

What we call a decade, a century, and a millennium represent only units on a calendar to which we have assigned numbers for our own purposes. These periods do not represent or correspond to any natural terrestrial, sidereal, or cosmic phenomena. Such periods are simply artifacts of human invention and convention. Thus, a millennium has no more cosmic significance than an intercalary date, such as February 29. Consequently, it is impossible to make a rational claim that the millennium—or any other calendar date or period—has a determinable cosmic significance or correlate.

There is, however, one cycle that does relate directly to a truly cosmic phenomenon. The solar system is located on the outer fringe of the Milky Way galaxy, which is the astronomical group of stars that includes the sun. The stars in our galaxy revolve around a point that is observed to be the center of the galaxy. Astronomical calculations indicate that the solar system will complete one revolution around the galactic center in some 225 million years. Unfortunately this datum is too large and imprecise to be employed for calendar purposes, but it provides at least a philosophic perspective against which to evaluate the imprecision of our actual calendars.

If the millennium has no cosmic or sidereal basis or importance, then we are left with the question of what its significance is. An answer to this question must begin with the recognition that the current millennium is the first in human history to be established by a widely accepted calendar. Although the Gregorian calendar numbers the years from 1000 to 2000 as the second millennium, in fact the idea of serially numbering the years beyond the reign of a current ruler was not even considered until the latter half of what we now call the first millennium. Such numeration did not become a general practice until about the beginning of the present millennium. Indeed, one of the important early events of our current millennium was development and adoption of the decimal system of numeration itself, which was first established in western Europe early in the thirteenth century.

A significant aspect of the current millennium clearly is that it has encompassed a period of more and greater cultural achievement than any other comparable period. It is impossible even to begin to list the millennium's cultural contributions. They fill multitudes of encyclopedic volumes, covering all fields of science, literature, the arts, philosophy, technology, government, farming, industry, transportation, communication, health care, life expectancy, as well as a host of amenities and conveniences.

Some idea of our cultural progress may be suggested by thinking of the year 999. Our European and African ancestors didn't even know of North and South America. William the Conqueror had not set sail for England. Printing had not been invented. Copernicus had not been born, and the generally accepted view was that the sun and stars revolved around the earth as the moon does. Science in the modern sense did not exist. There were no standard divisions of the day, as mechanical clocks had not yet been invented. The Magna Carta was more than two centuries into the future. None of the countries of Europe or Asia had the boundaries they would have a millennium later. Democracy in the modern sense had not yet been attempted. The decimal system of numeration was not yet established. Although the Julian calendar was widely used in Europe, the beginning of the year was a matter of local option everywhere.

Throughout history people have rejoiced at the termination of each of the many wars that have been waged. In the twentieth century there have been two "world wars," both of which have caused world celebrations, at least by the victors, when their military operations concluded. Late in the nineteenth century the Olympic games were revived with competition from nearly all nations in a series of contests that had some appearance of metaphorical conflicts, which also caused gloating by the victors. The approach to a new millennium is significantly different from all of these occasions.

The last years of the twentieth century are the first in human history in which there has been worldwide recognition that a millennium measured by a universally accepted calendar is about to end and a new one begin. The entire globe is now truly a new world which, whatever its other divisions and disputes, is united by electronic communication, confronting us all with the inescapable knowledge that a period of a thousand years of cultural achievement, interspersed with relapses into primitive barbarism, is coming to an end, and we must now cope with the future that this past millennium has brought to us. The popular attitude is heralded by the *New York Times* headline (July 20, 1996) "With a New Millennium, Some Great Expectations."

The most significant aspect of the transition to the new millennium now appears to be that this is the first time in human history that there has been a simultaneous universal celebration of a wholly peaceful event. This surely warrants the worldwide jubilation that will accompany the end of 1999 and herald the advent of a new calendar millennium.

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